

Technical Specifications

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Part	Latency	Cycle Time	Storage	Comments
TI F28377D	3 ms	5 ns	1 MB Internal / up to 128 GB external	Estimated 1 ms to issue ISR when event is detected from usb.
				2 ms to issue I2C/SPI command to TI F28377D.
				Storage can be extended via I2C or SPI MicroSD Card adapter.
TI F28335	2 ms	6.67 ns		Estimated 2 ms for ISR to detect and initiate shutdown.
Generic Keyboard	50 ms			Estimate worst case response time of a rubber dome keyboard.
Human Reaction time	200 ms			An estimate of average human response time.
Emergency Shutdown Response Time	55 ms			Keyboard response time + IRS Overhead + Protocol overhead.
Emergency Shutdown Human Response Time	255 ms			The sum of human response time and emergency shutdown sequence.
Logs	5-500 ms		1 – 10 KB	Time required to write logs to memory will vary based on the size, interface and flash specs.

Customer Needs

High Priority

1. Emergency Stop
2. Control API
3. Research Interface
 - a. RPM Control
 - b. Modes
 - i. Generation / Generator
 - ii. Regeneration / Motor
4. Error logging

Medium Priority

1. End User Dashboard
 - a. Current RPM
 - b. Stored Energy
 - c. System Status
 - i. Charging / Discharging
 - d. Graphs / Charts

Low Priority

1. Mobile Interface
2. Security
3. Multi-platform support

Needs-Metrics Matrix

Key:

1 - Not important

9 - Important

Needs / Metrics	<div style="display: flex; justify-content: space-between; padding: 5px;"> Keyboard Shortcuts User accounts Appearance is pleasant to look at Test suites Manual control System Status Graphs Built using standard design practices </div>							
User Friendly	1		3	9	9	5		7
Emergency Stop	9				9			
API		9			9	6		
Error Logging				9				
Research Interface	1	9	3	9	9	9		8
Dashboard	1		1			5	3	5
Mobile Application			1	1	1	1		1